AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application.

Listing of Claims:

1 (currently amended). A method of demodulating a received signal corresponding to a plurality of transmitted symbol sequences originating from both a first user and a second user, the method comprising:

initializing a first-user symbol sequence corresponding to the first user and a second-user symbol sequence corresponding to the second user and channel estimates for the first user and the second user <u>wherein the first user and the second user can be asynchronous</u>; and

jointly detecting the first-user symbol sequence and the second-user symbol sequence using, at each of a plurality of iterations previous first and second user symbol sequences and the channel estimates for the first user and the second user, and based on the use of transmit diversity by at least one of the first user and the second user.

2 (original). The method of claim 1 further comprising updating the channel estimates prior to each of the plurality of iterations.

3 (original). The method of claim 1 wherein channel estimates are obtained using alternate pilot channels in a code division multiplexed access (CDMA) system.

4 (currently amended). The method of claim 1 wherein initializing is accomplished by a semi-blind initialization procedure <u>wherein a channel estimate for only one of the first user and the second user is known</u>.

5 (currently amended). The method of claim 2 wherein initializing is accomplished by a semi-blind initialization procedure <u>wherein a channel estimate for only one of the first user and the second user is known</u>.

6 (currently amended). The method of claim 3 wherein initializing is accomplished by a semi-blind initialization procedure <u>wherein a channel estimate for only one of the first user and the second user is known</u>.

7 (currently amended). A method of demodulating a received signal corresponding to a plurality of transmitted symbols originating from both a first user and a second user, the method comprising:

indent initializing a first-user symbol corresponding to the first user and a second-user symbol corresponding to the second user and channel estimates for the first user and the second user <u>wherein the first user and the second user can be asynchronous</u>;

jointly detecting a first-user symbol and a second-user symbol at a current symbol time using previous first and second user symbols and channel estimates for the first user and the second user, and based on the use of transmit diversity by at least one of the first user and the second user; and

if additional symbol times remain, jointly detecting the first user symbol and the second user symbol at a next symbol time.

8 (original). The method of claim 7 further comprising:

predicting the channel estimates for a next symbol time, at least in part through the use of channel tracking; and

updating the first-user symbol and the second-user symbol.

9 (currently amended). The method of claim 7 wherein ~~the signals from the first user and the second user are asynchronous, and wherein~~:

the initialization further comprises the initialization of a pulse-shape component; and

the jointly detecting is accomplished at least in part through reference to the pulse-shape component.

10 (currently amended). The method of claim 8 wherein ~~the signals from the first user and the second user are asynchronous, and wherein~~:

the initialization further comprises the initialization of a pulse-shape component; and

the jointly detecting is accomplished at least in part through reference to the pulse-shape component.

11 (currently amended). Apparatus for demodulating a received signal corresponding to a plurality of transmitted symbol sequences originating from both a first user and a second user, the apparatus comprising:

means for initializing a first-user symbol sequence corresponding to the first user and a second-user symbol sequence corresponding to the second user <u>wherein the first user and the second user can be asynchronous</u>;

means for initializing channel estimates for the first user and the second user; and

means for iteratively and jointly detecting the first-user symbol sequence and the second-user symbol sequence using previous first and second user symbol sequences and the channel estimates for the first user and the second user, and based on the use of transmit diversity by at least one of the first user and the second user.

12 (currently amended). Apparatus for demodulating a received signal corresponding to a plurality of transmitted symbols originating from both a first user and a second user, the apparatus comprising:

means for initializing a first-user symbol corresponding to the first user and a second-user symbol corresponding to the second user <u>wherein the first user and the second user can be asynchronous</u>;

means for initializing channel estimates for the first user and the second user; and

means for jointly and recursively detecting a first-user symbol and a second-user symbol at specific symbol times using previous first and second user symbols and channel estimates for the first user and the second user, and based on the use of transmit diversity by at least one of the first user and the second user.

13 (currently amended). A receiving system operable to demodulate a received signal corresponding to a plurality of transmitted symbol sequences originating from both a first user and a second user, the system comprising:

a channel estimation unit operable to produce channel estimates for the first user and the second user; and

a detector unit operatively connected to the channel estimation unit, the detector unit operable to jointly detect a first-user symbol sequence and a second-user symbol sequence using previous first and second user symbol sequences and the channel estimates for the first user and the second user, wherein the first user and the second user can be asynchronous, and based on the use of transmit diversity by at least one of the first user and the second user.

14 (original). The system of claim 13 wherein the channel estimation unit updates the channel estimates prior to each of a plurality of iterations.

15 (original). The system of claim 13 wherein the channel estimation unit obtains channel estimates using alternate pilot channels in a code division multiplexed access (CDMA) system.

16 (currently amended). The system of claim 13 further comprising semi-blind initialization logic operatively connected to the channel estimation unit and the detector unit, the semi-blind initialization logic operable to initialize when a channel estimate for only one of the first user and the second user is known.

17 (currently amended). The system of claim 14 further comprising semi-blind initialization logic operatively connected to the channel estimation unit and the detector unit, the semi-blind initialization logic operable to initialize when a channel estimate for only one of the first user and the second user is known.

18 (currently amended). The system of claim 15 further comprising semi-blind initialization logic operatively connected to the channel estimation unit and the detector unit, the semi-blind initialization logic operable to initialize when a channel estimate for only one of the first user and the second user is known.

19 (currently amended). A receiving system operable to demodulate a received signal corresponding to a plurality of transmitted symbols originating from both a first user and a second user, the system comprising:

a channel estimation unit operable to produce channel estimates for the first user and the second user; and

a detector unit operatively connected to the channel estimation unit, the detector unit operable to jointly detect a first-user symbol and a second-user symbol at specific symbol times using previous first and second user symbols and the channel estimates for the first user and the second user, wherein the first user and the second user can be asynchronous, and based on the use of transmit diversity by at least one of the first user and the second user.

20 (original). The system of claim 19 wherein the detector unit further comprises a symbol update unit and the symbol update unit and the channel estimation unit each further comprise:

reformulation operators;

conjugation operators connected to the reformulation operators; and

multipliers and adders interconnected with the reformulation operators and conjugation operators.

21 (original). The system of claim 19 wherein the channel estimation logic predicts channel estimates at least in part through channel tracking.

22 (original). The system of claim 20 wherein the channel estimation logic predicts channel estimates at least in part through channel tracking.

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23 (currently amended). The system of claim 19 wherein the detector unit is further operable to ~~detect asynchronous signals through reference~~ refer to a pulse shape component.

24 (currently amended). The system of claim 20 wherein the detector unit is further operable to ~~detect asynchronous signals through reference~~ refer to a pulse shape component.

25 (currently amended). The system of claim 21 wherein the detector unit is further operable to ~~detect asynchronous signals through reference~~ refer to a pulse shape component.

26 (currently amended). The system of claim 22 wherein the detector unit is further operable to ~~detect asynchronous signals through reference~~ refer to a pulse shape component.

27 (currently amended). A mobile terminal comprising:

a processor system for controlling the operation of the mobile terminal;

a radio block operable to transmit signals, and also to receive signals corresponding to a plurality of transmitted symbols originating from both a first user and a second user;

baseband logic operatively connected to the radio block and the processor system, the baseband logic further comprising a channel estimation unit operable to produce channel estimates for the first user and the second user, and a detector unit operatively connected to the channel estimation unit, the detector unit operable to jointly detect first-user symbols and second-user symbols based on the channel estimates for the first user and the second user wherein the first user and the second user can be asynchronous, and based on the use of transmit diversity by at least one of the first user and the second user.

28 (original). The mobile terminal of claim 27 wherein the channel estimation unit performs block estimation and the detector unit performs block detection of the first user symbols and the second user symbols.

29 (original). The mobile terminal of claim 27 wherein the channel estimation unit performs recursive estimation using channel tracking and the detector unit performs recursive detection of the first user symbols and the second user symbols.

30 (currently amended). The mobile terminal of claim 29 ~~wherein the signals corresponding to the plurality of transmitted symbols originating from both the first user and the second user can be asynchronous, and further~~ wherein the detector unit operates with reference to a pulse shape-shape component.

31 (original). The mobile terminal of claim 27 wherein the channel estimation unit produces channel estimates by referring to alternate pilot channels in a code division multiplexed access (CDMA) system.

32 (original). The mobile terminal of claim 27 wherein the detector unit further comprises a symbol update unit, and the symbol update unit and the channel estimation unit each further comprise:

      reformulation operators;

      conjugation operators connected to the reformulation operators; and

      multipliers and adders interconnected with the reformulation operators and conjugation operators.

33 (original). The mobile terminal of claim 29 wherein the detector unit further comprises a symbol update unit, and the symbol update unit and the channel estimation unit each further comprise:

      reformulation operators;

      conjugation operators connected to the reformulation operators; and

      multipliers and adders interconnected with the reformulation operators and conjugation operators.

34 (original). The mobile terminal of claim 30 wherein the detector unit further comprises a symbol update unit, and the symbol update unit and the channel estimation unit each further comprise:

      reformulation operators;

      conjugation operators connected to the reformulation operators; and

      multipliers and adders interconnected with the reformulation operators and conjugation operators.